

Remarks

Claims 6, 7, 25, 27-29, and 40-78 stand rejected as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention (§112, ¶2). Claims 64-66 also stand rejected as being of improper dependent form for failing to further limit the subject matter of a previous claim (§112, ¶4). Claim 4 has been allowed over the prior art of record.

1. §112, Second Paragraph Rejections

A. As Amended, Claims 6, 7, and 27-29 Do Not Depend On A Canceled Claim

Examiner rejected claims 6, 7, and 27-29 as unclear due to their dependency on a canceled claim. As amended, claims 6 and 7 no longer depend on claim 5 and claims 27-29 no longer depend on canceled claim 26. Therefore, as amended, claims 6, 7, and 27-29 are clear and satisfy the requirements of 35 U.S.C. §112, second paragraph.

B. As Amended, Claims 25, 27, 52, 54, 55, 57, 58, 60, 61, 63, 64, 66, 67, 69, 70, 72, 73, 75, 76, and 78 Have A Properly Stated Reference Axis.

The Examiner rejected claims 25, 27, 52, 54, 55, 57, 58, 60, 61, 63, 64, 66, 67, 69, 70, 72, 73, 75, 76, and 78 because the references “radially” and “axially” in the claims are unclear without a properly stated reference axis. As amended, the claims specify the axis of rotation as the reference axis. Thus, because the reference axis has been properly stated, claims 25, 27, 52, 54, 55, 57, 58, 60, 61, 63, 64, 66, 67, 69, 70, 72, 73, 75, 76, and 78 are clear and satisfy the requirements of 35 U.S.C. §112, second paragraph.

C. As Amended, Claim 27 Is Clear Regarding Radial Stability

The Examiner rejected claim 27 because it is unclear how something already claimed as radially stabilized (claim 25) is again radially stabilized. In order to further clarify this claim, applicant has amended the claim to reflect that the magnet means in the housing in communication with diamagnets or permanent magnets in the impeller provide additional radial stabilization for the impeller. This amendment makes the embodiment of claim 27 clearer and satisfies 35 U.S.C. §112, second paragraph.

D. The Embodiments of Claims 40, 52, and 64 Would Operate Under The Claimed Possibility That The Diamagnets And Permanent Magnets Are Fixed To The Same Element.

The Examiner rejected claims 40, 52, and 64 because it is unclear how the apparatus would operate under the claimed possibility that diamagnets and permanent magnets are fixed to the same element. As specified in the claims, the orientation of the permanent magnets to the diamagnets affect the operability of the claimed fluid pump. The placement a diamagnet, a permanent magnet, or a combination thereof in either the impeller or the housing does not affect the operability of the present invention. In the present invention, the levitation and stabilization of the impeller occur due to the placement of the diamagnets and permanent magnets such that each permanent magnet in the impeller is in magnetic communication with a diamagnet in the housing and vice versa. This levitation and stabilization can be achieved by having both diamagnets and

permanent magnets in the same element as long as each permanent magnet in the housing is in communication with a diamagnet in the impeller and vice versa.

E. Claims 41, 44, 47, 50, 53, 56, 59, 62, 65, 68, 71, 74, and 77 No Longer Contain the Phrase "substantially similar"

Claims 41, 44, 47, 50, 53, 56, 59, 62, 65, 68, 71, 74, and 77 were rejected because the use of the phrase "substantially similar" is vague and indefinite. The claims 41, 44, 47, 50, 53, 56, 59, 62, 65, 68, 71, 74, and 77 have been amended to eliminate the term "substantially similar". The term "substantially similar" is a compound injection of approximation in the claim because both words connote approximation. The amendment eliminates the compound effect of the term by changing "similar" to --equal--. The claims as amended now include a single dose of approximation, which has long been accepted with terms such as "about" and "substantially" allowed in claim language. Support in the specification for the language "substantially equal" is found in the specification on page 6, lines 2-5.

F. Claims 42, 45, 48, 51, 54, 57, 60, 63, 66, 69, 72, 75, and 78 Clearly Define the Forces Which Levitate the Impeller.

The Examiner rejected claims 42, 45, 48, 51, 54, 57, 60, 63, 66, 69, 72, 75, and 78 because it is unclear whether it is the magnetic forces or the fluid forces (or both) that levitate the impeller. As amended, the claims clearly state that the fluid forces, the magnetic forces, or a combination thereof may levitate the impeller. Support for this amendment is found in the specification on page 21, lines 7-14.

G. As amended, Claims 43, 46, 49, 52, 55, 61, 64, 67, 70, 73, and 76 are no longer redundant.

The Examiner rejected claims 43, 46, 49, 52, 55, 61, 64, 67, 70, 73, and 76 redundant because the redundancy of "each said permanent magnet ... are oriented one of generally axially and radially" and "the plurality of permanent magnets are oriented generally axially and radially" makes each claim unclear. As amended, each of these claims recites only "each permanent magnet ... are oriented one of generally axially and radially", thereby making the claim clear and satisfying 35 U.S.C. §112, second paragraph.

II. Claims 64-66 Do Not Violate 35 U.S.C. §112, Fourth Paragraph

The Examiner rejected claims 64-66 as being of improper dependent form for failing to further limit the subject matter of a previous claim. Claims 64-66 do not violate 35 U.S.C. §112, fourth paragraph because claim 64 is an independent claim and claims 65 and 66 which depend on claim 64 further limit the subject matter of claim 64. Furthermore, claim 64 claims an embodiment where the permanent magnets are fixed with respect to the impeller, central frame, or the housing. This embodiment is not claimed in the other claims.

CONCLUSION

Applicant has complied with or obviated by amendment each of the bases for rejection of the claims on technical grounds. Consequently, the claims appear to be allowable and a Notice of Allowance for claims 6, 7, 25, 27-29, and 40-78 is requested.

Dated:

2/6/95

Respectfully submitted,

By Eugene L. Johnson

Eugene L. Johnson

Reg. No. 21,028

Dorsey & Whitney P.L.L.P.

Pillsbury Center South

220 South Sixth Street

Minneapolis, MN 55402-1498